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Ion exchange of Cu^{2+} , Ni^{2+} , Pb^{2+} and Zn^{2+} in analcime (ANA) synthesized from Thai perlite

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Abstract

This work studied the ion exchange of Cu^{2+} , Ni^{2+} , Pb^{2+} and Zn^{2+} into an analcime (ANA) in the temperature range 298–333 K. The analcime was produced from an economically available Thai perlite. The selectivity sequence for ions entering analcime in its as-synthesized sodium form was $\text{Pb}^{2+} > \text{Cu}^{2+} > \text{Zn}^{2+} > \text{Ni}^{2+}$, as indicated by values of ΔG^0 . The results demonstrated that the enthalpy of cation hydration determined the selectivity of the zeolite. ΔS^0 values were related to changes in water content. A comparison of the selectivity series for Pb, Cu, Ni, and Zn cation uptake into analcime to those of other zeolites shows similar trends.

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